REMARKS

Claims 1-38 were presented for examination December 8, 2000. In response to an Official Action of April 25, 2002, applicants amended the drawings and specification, however the claims remained unchanged. In an Official Action of November 6, 2002, the Examiner objected to the drawings and rejected claims 1-38 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,012,004 to Sugano et al. (hereafter referred to as "Sugano") in view of U.S. Patent No. 6,236,277 to Esker (hereafter referred to as "Esker"). Claims 1-38 are now pending without amendment.

OBJECTIONS TO DRAWINGS

In point one of the Official Action the Examiner objects to the drawings. Applicants apologize that new Figures 3 and 4 and a corrected Figure 1 were inadvertently excluded from applicants' Amendment dated July 24, 2002. They have been included in this response for the Examiner's approval. New formal drawings will be submitted upon Examiner approval. In light of this, applicants request the Examiner withdraw his objection.

CLAIM REJECTIONS – 35 USC § 103(a)

On page 2, point 2, of the Official Action, the Examiner rejects claims 1-38 under 35 USC § 103(a) as being anticipated by Sugano in view of Esker. Applicants respectfully traverse the rejection as there is no motivation to combine Sugano and Esker and Sugano teaches away from this combination.

Sugano teaches a system including a master controller for transmitting a counted time as a standard time, and a plurality of controllers for determining the time relating to the fault diagnosis on the basis of the received standard time when fault data of sensors, etc., are detected.

Esker teaches "a local clock used for synchronizing events in an industrial control system may be synchronized with a master clock according to synchronization signals received at a first period." (Esker Abstract).

The Examiner suggests in the Official Action that Sugano discloses all of the elements included in applicants' claims except a plurality of controllers having a local clock and a communication network and updating local time using the local clock in response to the update determination. The Examiner contends that Esker discloses the missing claim elements in Sugano and that it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the invention of Sugano et al to include the teaching of Esker because it would determine an error between its local clock and the master time. Applicants respectfully disagree.

In columns 1 and 2, Sugano includes a discussion of prior art, specifically Japanese Unexamined Patent Publication No. 4-304589 concluding in the following paragraph:

> In this case, however, the following problems are encountered. The operation counting clock included in each controller is operated only during the interval when the power of each controller is turned on. However, the power of each controller may be separately turned off due to the fault and an examination of each component, or a controller used in a certain period of time may be removed from the vehicle and attached to another vehicle, whereby the operation counting clocks of the power-turned-off controller and the newly attached controller cause differences between the operation counting clocks of other controllers and the master controller 1. In addition, the above operation counting clock and the time clock include clock errors between the controllers due to the variations of timers, etc. Therefore, in spite of a fault and a phenomenon occurring at the same time, there is a possibility that the stored clock values are different between controllers. This could be a major obstacle in investigation of the cause of the fault by analyzing the fault history data of the respective controllers and the state of progress of the input and output signals, and the fault diagnosis might require a lot of time.

Sugano clearly identifies multiple controllers having their own individual clocks which may not be synchronized as a potential problem in logging detected faults and conditions at correct times in relation to each other.

Sugano further states in column 3, lines 7-12:

> The present invention has been made to solve the problems of the prior art, and its object is to provide a system and a method for managing time for a vehicle fault diagnostic apparatus which can eliminate temporal contradictions and errors between controllers, and which can reliably perform fault diagnosis by accurate time.

> According to the present invention, there is provided a system for managing time for a vehicle fault diagnostic apparatus including a plurality of controllers for detecting a fault of at least one of a sensor and an actuator and for transmitting the detected fault data through a communication network, and a master controller for receiving the fault data,
>
> wherein the master controller transmits a counted time to the plurality of controllers as a standard time, and
>
> wherein the plurality of controllers, when detecting the fault data, determine the time relating to the fault diagnosis on the basis of the received standard time.

Sugano discloses an invention to overcome the problems in the prior art of multiple clocks with an invention that has only one clock, that in the master controller. The master controller transmits a counted time to a plurality of controllers as a standard time, thus eliminating the need for individual clocks in the other controllers and creating and transmitting a standard time determined by the master controller clock and stored in the memories of the other controllers.

There is absolutely no motivation to combine with Sugano "a plurality of controllers having a local clock and a communication network" or "updating local time using the local clock in response to the update determination", as claimed by applicants. In fact Sugano teaches away from this by eliminating the need for local clocks in controllers other than the master controller. Because Sugano discloses an invention that has solved the problem of multiple controller clocks not being synchronized by eliminating the multiple controller clocks, it would not be reasonable to then combine Sugano with Esker to add multiple clocks and a synchronization method to solve the same problem.

Since there is no motivation to combine Sugano with Esker the rejection of claims 1-38 is improper and should be withdrawn.

FURTHER DISAGREEMENTS

Applicants further disagree with the Examiner's statement on 2 in point 2 that detecting a fault of at least one sensor and an actuator can be interpreted as establishing an operating condition as defined in applicants' specification.

Applicants' specification discusses "operating characteristic" at least in part in terms of "indicative of machine, or equipment, operation, such as engine operation." (page 4,

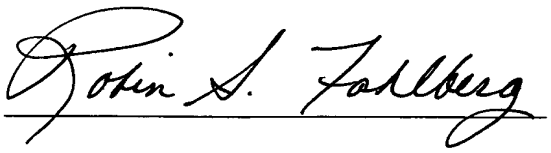
lines 28 and 29) or "indicative of whether the machine engine is running or stopped" (page 5, lines 1 and 2). The specification states "other indications of machine operation include engine oil pressure, or alternator activity, such as the alternator R terminal". The Examiner interprets a vehicle fault diagnostic apparatus for detecting a fault of at least one sensor and an actuator in Sugano as establishing an operating characteristic. Applicants submit that a detecting a fault of at least one sensor and an actuator is not equivalent to detecting an operating characteristic as discussed in applicants' specification. Detecting a fault is not always indicative of machine operation.

Sugano logs a fault and a time the fault occurred upon detecting a fault of at least one sensor and an actuator. Applicants' invention determines whether to update a local time in response to an operating characteristic.

CONCLUSION

It is respectfully urged that the subject application is in condition for allowance and allowance of the application at issue is respectfully requested.

Respectfully submitted,



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Marked Up Copy of Amendments pursuant to 37 CFR 1.121

Title: A Method and Apparatus of Managing Time for a Processing System
Application No. 09/732,545
Attorney Docket No. 00-216

In the Specification:

Page 3, following line 7:

Fig 3 is an illustration of one embodiment of a method to synchronize the time of a plurality of controllers with the master controller.

Fig. 4 is an illustration of one embodiment of a method to establish a master controller.

Twice Amended: Page 4, Lines 11-15:

In addition, each of the controllers 104 may be connected to one or more elements 110. In Figure 1, the one or more elements is a speed sensor 114. In other embodiments element 110 may include one or more sensors, actuators, displays or other elements adapted to interact with a controller 104.

Page 4, Lines 22-30, Page 5, Lines 1-8:

Fig. 2 illustrates one embodiment of the method of the present invention. The present invention includes a method of managing time for a processing system 104 located on a machine. In a first control block 202 an operating characteristic of the machine is established. In the preferred embodiment, the operating characteristic is indicative of machine, or equipment, operation, such as engine operation. Therefore, for example, the operating characteristic may be indicative of whether the machine engine is running, or stopped. In one embodiment a controller 104 may be connected to an element 110 that generates an operating characteristic signal. The element may be an engine speed sensor [(not shown)]114 or key switch (not shown). Other indications of machine operation include the engine oil pressure, or alternator activity, such as the alternator R terminal.

Page 5, Lines 9-30, Page 6, Lines 1-10:

Therefore, the controller 104 may receive an operating characteristic signal from an element 110 and responsively establish the operating characteristic of the machine, e.g., whether the machine is operating. In an alternative embodiment, one or more of the controllers 104, e.g., such as a master controller if one is utilized, may establish the operating characteristic of the machine, and responsively broadcast the operating characteristic signal to the other controllers. The controller establishing the operating characteristic does not have to be the master controller. The receiving controllers 104 may receive the operating characteristic signal and responsively locally establish the operating characteristic of the machine, e.g., whether the machine is operating. Therefore, the operating characteristic signal is a signal indicative of the operating characteristic of the machine. In one embodiment, the operating characteristic signal may be a signal such as an engine speed signal received from an engine speed sensor 114. Alternatively, the operating characteristic signal may be a signal generated from one of the controllers, e.g., a master controller 104, which is indicative of the machine operation. In the event the operating characteristic signal is received from another controller 104, the signal may include a binary bit indicating the machine is either operating, or not operating. Therefore, the characteristic signal may be received from elements 110, or other controllers, and used to locally establish the operating characteristic of the machine.

Page 13, Lines 29-30, Page 14, Lines 1-30, Page 15, Lines 1-4:

"In the preferred embodiment, on power up, an arbitration process is initiated by one or more of the controllers 104. For example, on power up, a controller 104 may send out an arbitration signal indicating the initiation of arbitration. The controllers 104 may respond by generating a priority signal indicative of one or more characteristics of the controller 104. Each controller 104 receives the generated priority signals and determines whether it should become the master controller or remain a non-master controller 104. The controller 104 that becomes the master controller 104 then begins to establish an operating

characteristic indicative of whether the machine is operating. The master controller may be connected to an element such as an engine speed sensor 114. Therefore, the master controller will receive an operating characteristic signal, e.g., engine speed signal. The operating characteristic signal may be received from an engine speed sensor 114, key switch, engine oil pressure, alternator signal, or other signal indicative of machine operation. The master controller 104 generates an operating characteristic signal which includes data indicative of the operating characteristic. The master controller 104 also updates a local time, as do the other controllers 104, in response to the operating characteristic. In practice, the local clock of each controller 104 updates the local time. For example, regarding the master controller 104, when an engine speed sensor signal indicates the engine has begun running, the local clock begins updating the local time, and continues updating until the engine speed sensor signal indicates the engine has stopped running. The master controller 104 broadcasts an official time signal, preferably less frequently than the operating characteristic signal.

Page 115, Lines 5-25:

The non-master controllers 104 determines and maintain a local time. The non-master controllers 104 establish an operating characteristic. For example, they receive the operating characteristic signal which contains the data indicative of the operating characteristic from the master controller 104. Alternatively, the controllers 104 may also be connected to an element, such as an engine speed sensor 114, that generates an operating characteristic signal. In this case, the controller 104 may directly establish the operating characteristic of the machine independent of receiving an operating characteristic signal from the master controller 104. The non-master controllers 104 update the local time when the operating characteristic indicates the machine is operating, and continue to update the time until the operating characteristic indicates the machine is not operating. The resolution of the local time generated by the local clock is based upon the resolution of the local time base signal generated by a local oscillator 112."